

Original Article

Knowledge, Attitude and Practices towards Menstrual Hygiene among Government and Private School Girls

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Abstract:

Menstruation is a normal physiological process unique to females. Pre-menarche is characterized by physiological, cognitive, and psychological transitions which may be initiated from the midst of their second decade. The onset of puberty/ menstruation in girls tends to change their role in society. Overall inadequate awareness levels accompanied by socio-cultural taboos and prevailing myths and misconceptions about menarche and menstruation have played havoc on human society. **Objective:** To diagnose and compare the prevailing level of knowledge, attitude, and practices of adolescent girls studying in government and private schools towards menstrual hygiene and management. **Methods:** This Analytical and cross-sectional study was conducted at Government Jouhar Girls High School and Shiblee Grammar School System, Gulberg Branch (private) Faisalabad. A self-administered survey-based questionnaire was developed. Prior formal written approval from school authorities was followed by the pre-planned scheduled visits, explaining the purpose of the study, assuring confidentiality of acquired information, and self-administration of survey-based questionnaires. **Results:** The results indicated that the mean age at menarches of the girls was 13.69±0.95 years. A relatively more percentage of government (59.6%) school respondents followed by private school respondents (57.1%) had satisfactory knowledge about their age of first menarche ($p = 0.806$). Motivated by the socio-cultural taboos and /or fear or shame a majority of government (59.6%) and private school respondents (57.1%) had satisfactory knowledge about their age of first menarche ($p = 0.806$). A strong prevalence of Urinary Tract Infection (UTI) was found in private school girls 87(49.2%) and 21(11.9%), followed by respective percentages of 78(43.8%), 16(9.0%) amongst the government school respondents who recorded their responses as agreed and strongly agreed about the development of reproductive tract infection in the post-menstruation period. As far as the adoption of hygienic practices is concerned a relatively high percentage of government school 28(15.7%) followed by private school 14(7.9%) girls strongly disagreed about changing their absorbent material on daily basis. The development of skin abrasions like rashes, itching, and urinary tract infection was found in a relatively high proportion amongst the government school girls 30(16.9%) followed by private school respondents 18(10.2%) in the post-menstruation period. A most common and alarming unhygienic practice prevalent amongst the government and private school girls was the reuse of absorbent cloth, who responded as agreed and strongly agreed in respective terms as 43(24.2%), 22(12.4%), and 69(39%) and 28(15.8%). **Conclusions:** The study concluded that the persistent myths, misconceptions, socio-cultural taboos, and unhygienic practices *i.e.* use of old clothes as absorbent, reuse of absorbent material, and delaying tendency of changing absorbent, amongst the

adolescent school girls of government and private institutes which may pose direct adverse health and life quality concerns for the female Pakistani community. The current situation calls for active participatory contributions from education communities to initiate various communication and awareness campaigns regarding pre-menarche knowledge and menstruation management which may aid to strengthen and transform their role as a significant representative of society.

Keywords: Menstrual management, Menarche, Hygiene, Knowledge, Practice, Attitude

Introduction:

Puberty in both genders has been recognized by specific characteristics which transform their role in society [1]. Adolescence/puberty in girls is the onset of menstruation and/or menarche which is accompanied by physiological, cognitive, and psychological transitions [2-4]. Menstrual hygiene plays a significant role in improving the life and health quality concerns of females [5, 9]. Today's healthy adolescent girls may define tomorrow's healthy mothers [6, 9, 10]. Different socio-cultural and so-called religious taboos have associated menstruation with various misconceptions and myths [9, 11-13].

Social prohibitions, cultural restrictions, and physical isolation of menstruating females have further reinforced a dominant-negative narrative against menarche [3, 32-33]. Studies have indicated that the majority of adolescent girls had insufficient and inadequate information about menarche and menstruation. It speaks a lot about future fertility repercussions amongst adolescent girls accompanied by psychological burden and hygienic-driven medical issues.

Female hygiene practices involved during menstruation hold significant importance which may increase their vulnerability to psychological, physiological, and certain medical issues *i.e.* skin abrasion, Reproductive Tract Infections [2,3]. Adolescent girls deficient in pre-menarche knowledge, facing negative sociocultural attitudes coupled with the adoption of unhygienic menstrual practices may equally face frustration, psychological burden, and other life and health quality concerns like skin abrasions, irritations and urinary tract infections [4, 6, 7].

Prevailing illiteracy, deficient educational knowledge, financial hindrances, lack of guidance and facilities for adolescent girls to

manage their menstruation in school has served as a barrier to manage the neglected public socio-cultural and health issues that require prioritization by public health authorities [12-14]. Global reviews and country-specific researches have unveiled the undeniable significance and future implications of adequate and sufficient knowledge about puberty and menstruation in girls. The current study has been regarded as relevant to access the information of prevailing knowledge, to diagnose disparities amongst the attitude and practices of government and private school's adolescent girls. Future aims include empowering women through various educational, awareness, and communication campaigns to strengthen and transform their role as an important icon of society.

Methods:

The current study was formulated as a questionnaire-based cross-sectional study, intended to compare KAP regarding menstrual hygiene amongst adolescent girls. The study involved random samples from two schools *i.e.* one Government sector and the other Private sector educational institute. The government and private sector educational institutes were respectively named as Government Jouhar Girls High School and Shiblee Grammar School System, Gulberg Branch, Faisalabad. The current study involved a total number of three hundred and fifty-five (355) girl respondents, studying in government and private institutes. The sample size was estimated by involving percentages of knowledge (36%),²¹ margin of error (5%), and confidence level (95%).

Where,

n = Sample Size 355

$Z_{1-\alpha/2}$ = fixed alpha (α) at 0.05(95%confidence) = 1.96

P = good knowledge Proportion = 0.36²¹

1-P = 0.64

d = allowable error=0.05

$$n = \frac{z_{1-\frac{\alpha}{2}}^2 p(1-p)}{d^2}$$

The study excluded those participants who were not willing to participate. In addition to this, Girls having any genital disorders were also excluded from the study. Inclusion of participants, however, was ensured by prior approval from The Institutional Review Board, University of Lahore, Pakistan. Schoolgirls aged between 11-15 years, who had attained the age of menarche were selected. The Ethical Committee of the University of Lahore has set forth the rules and regulations to preserve, promote and value the rights of participants. These involve the written formal consent, data confidentiality, devoid of any disadvantages or risks in the procedures, and anonymous participation of respondents.

A self-administered questionnaire was designed and generated from the adaptations and literature acquired from the various interview-based studies. The questionnaire was formulated in bilingual medium (English and Urdu) of instructions to ensure the ease and comfort of respondents. Prior formal approval was acquired from school authorities was followed by the pre-planned scheduled visits, explaining the purpose of the study, assuring confidentiality of acquired information, and self-administration of survey-based questionnaires. Pilot testing was conducted and the value appeared as 0.78. Written consent was obtained from school girls before the administration of the questionnaire.

The collected and/or acquired data were analyzed by using Statistical software (SPSS-25). Mean \pm S.D values were calculated for the collection of quantitative data like age. Qualitative data (i.e. Knowledge, Attitude, and practices) of the participants were collected and calculated in terms of the indicators like frequency and percentage scores. Chi-square

test was applied for the comparative description regarding KAP factors and scoring trends among various groups of respondents. P-value lesser and equal to 0.05 ($P \leq 0.05$) was considered as a significant value.

Results:

The results indicated that out of three hundred and fifty-five (355) girls respondents, a respective 178 and 177 number of government and private respondents had attained the ages of menarche at 13.51 ± 1.01 and 13.88 ± 0.84 years (Table 1).

Menarche Age (years)	School Type	
	Government	Private
N	178	177
Mean \pm SD	13.51 \pm 1.01	13.88 \pm 0.84

Table 1: A comparative description of the menarche ages amongst the government and private school respondents

The study involved a total number of three hundred and fifty-five girls respondents. Results indicate that 35% (n=64) and 28.7% (n=51) of participants from government schools were studying in 8th and 7th classes, respectively. Whereas, 46.3% (n= 82) and 27.7% (n=49) girls respondents were respectively studying in 8th and 7th Standards of private educational institutes.

Knowledge Regarding Menstrual Hygiene

The results indicated that only a meager respective percentage of government (4.5%) and private (12.4%) school respondents had adequate knowledge about menstruation ($p = 0.001$). More than half of government (59.6%) and private school respondents (57.1%) had satisfactory knowledge about their age of first menarche ($p = 0.806$). Fifty percent of private school respondents (50.2%) followed by 41.5% of government school respondents opined for no obvious association between mood swings, headaches, and menstruation (Table 2).

As far as the knowledge regarding an association between body weight and menstruation is concerned, a respective percentage of 23.6% and 34.3% of government school girls followed by

27.1% and 41.2% of private school girls responded in favor of “disagree” and “strongly disagree” trends ($p = 0.81$). Girls from government schools responded as “agree” and “strongly agree” in favor of the question “Whether

excessive bleeding leads toward anemia? were indicated by percentages 88(49.4%) and 30(16.9%), respectively, whereas private school girls responded as 59(33.3%) and 36(20.3%), respectively ($p = 0.046$).

Knowledge				Attitude				
Do You Think?	School Type		p-value	Do You Think?	School Type		p-value	
	Govt.*	Private			Govt.*	Private		
Knowledge about menstruation	S.D	111 (62.4%)	76 (42.9%)	0.001	Girls must seek medical help/advice	37 (20.8%)	51 (28.8%)	0.008
	D	41 (23.0%)	67 (37.9%)			86 (48.3%)	76 (42.9%)	
	N	18 (10.1%)	12 (6.8%)			22 (12.4%)	6 (3.4%)	
	A	8 (4.5%)	16 (9.0%)			22 (12.4%)	32 (18.1%)	
	S.A	0 (0.0%)	6 (3.4%)			11 (6.2%)	12 (6.8%)	
Knowledge about the age of your 1 st menarche	S.D	22 (12.4%)	20 (11.3%)	0.806	Bathing is safe during menstruation?	31 (17.4%)	34 (19.2%)	0.302
	D	45 (25.3%)	42 (23.7%)			39 (21.9%)	42 (23.7%)	
	N	5 (2.8%)	14 (7.9%)			19 (10.7%)	23 (13.0%)	
	A	84 (47.2%)	87 (49.2%)			54 (30.3%)	58 (32.8%)	
	S.A	22 (12.4%)	14 (7.9%)			35 (19.7%)	20 (11.3%)	
Menstruation is associated with headache & mood changes	S.D.	20 (11.2%)	30 (16.9%)	0.036	Do you feel any psychological burden these days?	18 (10.1%)	16 (9.0%)	0.530
	D	54 (30.3%)	59 (33.3%)			37 (20.8%)	34 (19.2%)	
	N	22 (12.4%)	15 (8.5%)			20 (11.2%)	14 (7.9%)	
	A	57 (32.0%)	63 (35.6%)			78 (43.8%)	93 (52.5%)	
	S.A	25 (14.0%)	10 (5.6%)			25 (14.0%)	20 (11.3%)	
Menstruation is associated with bodyweight	S.D	42 (23.6%)	48 (27.1%)	0.81	Get urinary tract infection after menstrual cycle	30 (16.9%)	20 (11.3%)	0.463
	D	61 (34.3%)	73 (41.2%)			47 (26.4%)	44 (24.9%)	
	N	22 (12.4%)	8 (4.5%)			7 (3.9%)	5 (2.8%)	
	A	43 (24.2%)	38 (21.5%)			78 (43.8%)	87 (49.2%)	
	S.A	10 (5.6%)	10 (5.6%)			16 (9.0%)	21 (11.9%)	
Excessive bleeding leads toward anemia	S.D	24 (13.5%)	32 (18.1%)	0.046	Suffer rashes, itching, and urinary tract infection after the menstrual cycle?	34 (19.1%)	14 (7.9%)	0.003
	D	30 (16.9%)	42 (23.7%)			33 (18.5%)	44 (24.9%)	
	N	6 (3.4%)	8 (4.5%)			22 (12.4%)	22 (12.4%)	
	A	88 (49.4%)	59 (33.3%)			59 (33.1%)	79 (44.6%)	
	S.A.	30 (16.9%)	36 (20.3%)			30 (16.9%)	18 (10.2%)	

Table 2: Knowledge and Attitude of Adolescent girls regarding Menstruation Hygiene

*Govt.= Government; S.D= Strongly Disagree; D= Disagree; N= Neutral; A= Agree; S.A.= Strongly Agree

Attitude Regarding Menstrual Hygiene

A positive trend (agree and strongly agree) toward seeking medical help was found more predominant amongst private school respondents (18.1% and 6.8%) than government school respondents (12.4% and 6.2%). However, 37(20.8%) and 51(28.8%) girls from government and private schools, respectively, were found adamantly opposing (strongly disagree) to seek any medical help/advice during menstruation (Table 2).

Fifty percent of government school respondents (50%) were found to show a positive trend (agree and strongly agree) toward both taking a bath and cleaning the external genitalia during menstruation. However, this trend was found less frequent amongst the private school respondents with respective cumulative percentages (agree and strongly agree) up to 44.1% and 42.5% toward taking a bath and cleaning the external genitalia during menstruation.

A comparative analysis among the attitudes of government and private school respondents, indicated a respective percentage of 15.2%, 14.0%, and 10.2%, 11.3% regarding their strong preferences to take medicine and feeling psychological burden these days with respective p values of 0.006 and 0.530.

A strong prevalence of Urinary Tract Infection (UTI) was found in 78(43.8%) and 16(9.0%) government school girls, who recorded their responses as agreed and strongly agreed about the development of infection in the post-menstruation period. Whereas the prevalence of UTI was found in respective percentages of 87(49.2%) and 21(11.9%) amongst the private school girls who agreed and strongly agreed regarding the development of Urinary Tract Infection (UTI).

Government school girls 30(16.9%) followed by private school 20(11.3%) girls strongly disagreed about the development of urinary tract infection (UTI) in the post-menstrual cycle. The difference in their responses has been found statistically significant (p-value=0.463). A relatively high

percentage of government school girls 28(15.7%) followed by private school 14(7.9%) strongly disagreed about changing their absorbent material daily. A statistically high significant difference was found between their percentages and/or values (p-value=0.002). Similarly, a relatively high proportion of government school girls 30(16.9%) followed by private school respondents 18(10.2%) reported suffering from rashes, itching, and urinary tract infection after the menstrual cycle. These percentile values were statistically significant (p=0.003).

A comparative analysis among the practices of government and private school respondents indicated a respective percentage of 11.2%, 16.9%, and 6.8%, 29.9% regarding their strong preferences to use cloth and sanitary pads, as the absorptive material during menstruation. However, a strong tendency of using sanitary pads as absorbent was observed cumulatively (agree plus strongly agree) in private school (46.8%) followed by government (45%) school respondents during menstruation. This difference was statistically found as significant (p= 0.019).

Table 3 reveals the disposal practices of government and private school girls during menstruation with respective values of 43(24.2%) and 27(15.3%) for disposing of the absorbent material in dustbins. A proportionately large percentage of government and private school girls responded as agreed and strongly agreed regarding the re-use of the cloth in respective terms as 43(24.2%), 22(12.4%), and 69(39%) and 28(15.8%). The current difference in values and/or percentages of the practices regarding the reuse of cloths were found statistically significant (p=0.003).

However, the difference between government and private schools was found statistically significant (p=0.097) for washing hands after disposing of the absorbent. It was evident that 64(36.0%) and 68(38.4%) of government and private school girls agreed that they drink less water during menstruation. However, a relatively less tendency of drinking cold water during

menstruation was found in government school girls (p-value=0.037).
43(24.2%) girls than in private school 24(13.6%)

What do you think?		School Type		p-value
		Government	Private	
Prefer to use cloth as an absorbent in menstruation	S. D.	33(18.5%)	45(25.4%)	0.046
	D	56(31.5%)	72(40.7%)	
	N	16(9.0%)	10(5.6%)	
	A	53(29.8%)	38(21.5%)	
	S. A.	20(11.2%)	12(6.8%)	
Prefer to use a sanitary pad as an absorbent in menstruation?	S. D.	35(19.7%)	30(16.9%)	0.019
	D	46(25.8%)	47(26.6%)	
	N	17(9.6%)	17(9.6%)	
	A	50(28.1%)	30(16.9%)	
	S. A.	30(16.9%)	53(29.9%)	
Change absorbent per day?	S.D	28(15.7%)	14(7.9%)	0.002
	D	51(28.7%)	40(22.6%)	
	N	21(11.8%)	10(5.6%)	
	A	60(33.7%)	91(51.4%)	
	S.A.	18(10.1%)	22(12.4%)	
Change absorbent material at night?	S.D.	33(18.5%)	24(13.6%)	0.001
	D	40(22.5%)	74(41.8%)	
	N	23(12.9%)	23(13.0%)	
	A	60(33.7%)	46(26.0%)	
	S. A.	22(12.4%)	10(5.6%)	
Do you re-use the cloth?	S.D.	41(23.0%)	22(12.4%)	0.003
	D	60(33.7%)	43(24.3%)	
	N	12(6.7%)	15(8.5%)	
	A	43(24.2%)	69(39.0%)	
	S. A.	22(12.4%)	28(15.8%)	
Dispose of absorbent material in the dustbin?	S. D.	18(10.1%)	27(15.3%)	0.023
	D	39(21.9%)	53(29.9%)	
	N	22(12.4%)	11(6.2%)	
	A	56(31.5%)	59(33.3%)	
	S. A.	43(24.2%)	27(15.3%)	
Wash hands after disposing of absorbent?	S. D.	16(9.0%)	8(4.5%)	0.097
	D	23(12.9%)	37(20.9%)	
	N	22(12.4%)	14(7.9%)	
	A	82(46.1%)	80(45.2%)	
	S. A.	35(19.7%)	38(21.5%)	
Do you dry undergarments under sunlight?	S. D.	19(10.7%)	18(10.2%)	0.621
	D	30(16.9%)	32(18.1%)	
	N	20(11.2%)	22(12.4%)	
	A	67(37.6%)	75(42.4%)	
	S. A.	42(23.6%)	30(16.9%)	

Table 3: Practices of Adolescent Girls Regarding Menstrual Hygiene

*S.D. = Strongly Disagree; D= Disagree; N= Neutral; A= Agree; S.A.= Strongly Agree

The private school girls (28.3%) recorded their cumulative (disagree and strongly disagree) denial for drying their undergarments under sunlight followed by government school respondents (27.6%). The difference in values and/or percentages was statistically not significant of each other ($p=0.621$). As far as the tendency of changing the absorbent is concerned a relatively high percentage of private school girls (63.8%) followed by government school (43.8%) respondents were found changing the absorbent on daily basis. Keeping in view, medical and hygienic issues, girls were questioned about the changing tendency of absorbent at night, which was responded as negative by relatively more government school respondents 33(18.5%) than private school 24(13.6%) girls. This difference in responses was statistically calculated as significant ($p\text{-value}=0.001$).

Scores	School Type	Mean±SD	P-Value
Knowledge	Government	18.33±3.5	0.104
	Private	17.65±4.3	
Attitude	Government	30.38±4.9	0.229
	Private	29.77±4.5	
Practice	Government	31.13±5.2	0.080
	Private	32.09±5.1	

Table 4: Comparison of Mean Knowledge, Mean Attitude and Mean Practice Scores amongst Adolescent girl Respondents

The mean value of knowledge scores prevalent among government and private school respondents was 18.33 ± 3.53 and 17.65 ± 4.3 , respectively. The difference in their knowledge scores was found statistically significant ($p=0.104$). Government and private school respondents indicated mean attitude scores of respective values 30.38 ± 4.9 and 29.77 ± 4.5 . The statistical values of the mean attitude score was found ($p=0.229$) significant (Table 4).

The information about mean practice scores of respondents indicated respective values of 31.13 ± 5.2 and 32.09 ± 5.1 regarding government and private educational institutes. The

difference between the mean practice values has been found statistically significant ($P=0.080$).

Discussion:

The current study involved population sizes of three hundred and fifty-five (355) girls respondents, as compared to other similar studies indicating the ranges of sample sizes varying from 150-314 [2,9,15,17]. As far as, the inclusion and exclusion criteria is concerned, thirty out of forty-four studies were based on cross-sectional descriptive analysis. Whereas, majority of studies (40/44) involved school-based sample populations [21], which is in correspondence to the current study.

The current study indicated that respondents studying in government ($n=228$) and private ($n=177$) institutes had attained the ages of menarche at 13.51 ± 1.015 and 13.88 ± 0.84 years, respectively, which is in line with the study indicating the average respective menarche ages of 12.3 and 11-13 years indicating the percentages of respondents as 73% ($n=165$) and 88.4% ($n=146$) [15]. Whilst few other studies reported 15.1 and 16.26 years as the mean menarche age in governmental and private school female respondents [26]. According to another KAP study, 16.8% and 7.6% of female respondents from governmental and non-governmental institutes were ranged between 18-19 years [17].

A Nepal-based study indicated that almost seventy percent (67.4%) of girl respondents had a fair level of knowledge followed by 26.4% who had good knowledge on menstrual hygiene management [27]. However, the current study showed the overall mean knowledge, attitude, and practice scores of the respondents as 17.99 ± 3.95 , 30.07 ± 4.7 , and 31.61 ± 5.18 about menstrual hygiene. Another study, however, revealed above fifty percent of respondents had weak knowledge (53.3%) and practice (52.8%) on menstruation and menstrual hygiene [18].

Some KAP studies considered the use of cotton, sanitary, and cloth pads of various commercially available brands during menstruation in their analysis. Studies indicated the practice of

almost fifty percent (49.35%) respondents using sanitary pads followed by 45.74% using old cloths and 4.90% reported new clothes as absorbent material during menstruation [2]. Our study is in correspondence to these findings, a strong tendency of using sanitary pads as absorbent was observed in almost half of private school (46.8%) followed by government (45%) school respondents during menstruation.

Similarly, a high percentage of urban girls (60.58%), as reported by fewer studies, were followed by rural girls (30.82%) who were found using sanitary pads. The resultant statistically significant ($p=0.019$) difference in percentage value [2] is in line with the statistically significant difference found by our study ($p=0.019$). A Nigerian study reported a very high proportion of adolescent girls (93.8%) using sanitary pads as absorbent material during menstruation [25]. It is evident from various researches that a major chunk of adolescent girls valued and preferred sanitary pads over absorbent cloth but the former's unaffordable cost made its access difficult for them. [22, 24, 25, 28, 29]. Whilst an India-based study indicated that almost seventy percent (68%) of the adolescent girls have chosen and used falalin cloths followed by 32% of girls preferring sanitary pads. However, none was observed valuing and preferring old clothes [24]. A high prevalence of using old clothes was found in rural girls (62.33%) followed by (35.68%) urban girls indicating a statistically significant ($p=0.001$) difference in percentage [2]. Our comparative analysis of government and private school respondents indicated a respective percentage of 11.2%, and 6.8% regarding their strong preferences to use cloth as the absorptive material during menstruation with a statistically significant difference ($p=0.046$) between government and private school girls pertaining to the use of old clothes as menstrual absorbent material.

Few studies considered hygienic cloths and/or new clothes in their studies. A majority of girls surveyed responded differently for disposing of absorbent material, burning, for instance, was

used by more than half of the girls (52.2%) followed by throwing away (39.79%) and 6.72% responded in the favor of other disposal methods [21,24,25].

Our study, however, revealed the disposal practices of government and private school girls, who agreed 56(31.5%), 59(33.3%) and strongly agreed 43(24.2%), with respective values of 43(24.2%) and 27(15.3%), 27(15.3%) for disposing of the absorbent material in dustbins. A proportionately high percentage of rural (60.96%) and urban girls (46.89%) were reported to burn the used absorbent material which aided to serve the disposal purpose [2]. Another study in line with our study found that the tendency of throwing the absorbent material was found more prevalent in urban girls (45.23%) than rural girls (12.33%). The difference in their statistical values was found significant (0.001) for rural and urban girls [2].

It has been evident from our study that adolescent girls may face skin rashes, itching, and the development of Urinary tract infections (UTI) like medical and hygienic-related life quality issues. It indicated that half of the government (50%) and private school (54.8%) girls were found suffering from these adverse issues of health quality. Certain India-based researchers associated reused absorbents and/or alternating with injuries and illness in girls [24].

There are various ways through which the adverse impacts of using old clothes and/or reused clothes as absorbent material could be educated to the community. To serve this purpose studies reported the provision of sanitary pads coupled with educating the community as an effective tool in improving girl's attendances at schools [23, 31]. Similarly, the least adverse health and life quality concerns were reported by a study introducing the falalin clothes, as the hardware intervention, an easily available low cost, highly absorbent red material in countryside India [24].

Conclusions:

Adolescent girls reported life quality concerns and issues including skin abrasions and

reproductive tract infection during menstruation which may be traced to the use of old clothes as absorbent, re-use of cloth and /or sanitary pads, delayed changing tendency of absorbent, and by adopting some unhygienic means like prevailing occasional trend of washing hands after disposing of absorbents, insufficient sunlight exposure of undergarments after washing, etc. There is a stringent need for adolescent girls to have ample, accurate, and adequate levels of information regarding sanitary and hygienic management of menarche and menstruation.

References:

1. Sivakami, M., van Eijk, A. M., Thakur, H., Kakade, N., Patil, C., Shinde, S., et al. (2019). Effect of menstruation on girls and their schooling, and facilitators of menstrual hygiene management in schools: surveys in government schools in three states in India, 2015. *Journal of Global Health*, **9**(1):010408. doi: 10.7189/jogh.09.010408
2. Thakre, S. B., Thakre, S. S., Reddy, M., Rathi, N., Pathak, K., Ughade, S. (2011). Menstrual hygiene: knowledge and practice among adolescent school girls of Saoner, Nagpur district. *Journal of Clinical and Diagnostic Research*, **5**(5): 1027-33.
3. Garg, R., Goyal, S., Gupta, S. (2012). India moves towards menstrual hygiene: subsidized sanitary napkins for rural adolescent girls-issues and challenges. *Maternal and child health Journal*, **16**(4): 767-774. doi: 10.1007/s10995-011-0798-5
4. Jha, S. (2019). Effectiveness of planned audio teaching program on menstrual hygiene in terms of knowledge among visually challenged adolescent girls, in selected blind school, West Bengal. *International Journal of Scientific Research and Education*, **6**(10). doi: 10.5958/2454-2660.2016.00058.2
5. Senapathi P, Kumar H. A. (2018). Comparative study of menstrual hygiene management among rural and urban adolescent girls in Mangaluru, Karnataka. *International Journal of Community Medicine and Public Health*, **5**: 2548-56. doi:10.4103/jfmpc.jfmpc_69_19.
6. Kavitha, M., Jadhav, J., Ranganath, T. S. (2018). Vishwanatha. Assessment of knowledge and menstrual hygiene management among adolescent school girls of Nelamangala. *International Journal of Community Medicine and Public Health*, **5**: 4135-4139. doi:10.18203/2394-6040.IJCMPh20183608
7. Aswathy, M. G., Saju, C. R., Mundodan, J. M. (2019). Awareness and practices regarding menarche in adolescent school going girls of Thrissur educational district. *International Journal of Community Medicine and Public Health*, **6**: 755-758. doi:10.18203/2394-6040.ijcmph20190202
8. Sommer, M., Caruso, B. A., Sahin, M., Calderon, T., Cavill, S., Mahon, T., Phillips-Howard, P. A. (2016). A time for global action: addressing girls' menstrual hygiene management needs in schools. *PLOS Medicine*, **13**(2): e1001962 <https://doi.org/10.1371/journal.pmed.1001962>
9. Srinivasan, D., Agrawal, T., Attokaran, T., Fathima, F. N., Johnson, A. R. (2019). Awareness, perceptions and practices regarding menstruation and menstrual hygiene among students of a college in Bengaluru Urban district, South India: a cross sectional study. *International Journal of Community Medicine And Public Health*, **6**(3): 1126-1132. doi: <http://dx.doi.org/10.18203/2394-26040.ijcmph20190597>
10. Srinivasan, D., Agrawal, T., Attokaran, T., Fathima, F. N., Johnson, A. R. (2019). Awareness, perceptions and practices regarding menstruation and menstrual hygiene among students of a college in Bengaluru Urban district, South India: a cross sectional study. *International Journal of Community Medicine and Public Health*, **6**(3), 1126-1132. doi:

- <http://dx.doi.org/10.18203/2394-6040.ijcmph20190597>
11. Alam, M. U., Luby, S. P., Halder, A. K., Islam, K., Opel, A., Shoab, A. K., et al. (2017). Menstrual hygiene management among Bangladeshi adolescent schoolgirls and risk factors affecting school absence: results from a cross-sectional survey. *BMJ Open*, **7**(7): e015508. doi: 10.1136/bmjopen-2016-015508.
 12. Gultie, T., Hailu, D., Workineh, Y. (2014). Age of menarche and knowledge about menstrual hygiene management among adolescent school girls in Amhara province, Ethiopia: implication to health care workers & school teachers. *PLoS One*, **9**(9): e108644. <https://doi.org/10.1371/journal.pone.0108644>
 13. Upashe, S. P., Tekelab, T., Mekonnen, J. (2015). Assessment of knowledge and practice of menstrual hygiene among high school girls in Western Ethiopia. *BMC women's health*, **15**(1): 1-8. doi: 10.1186/s12905-015-0245-7
 14. Sommer, M., Hirsch, J. S., Nathanson, C., Parker, R. G. (2015). Comfortably, safely, and without shame: defining menstrual hygiene management as a public health issue. *American Journal of Public Health*, **105**(7):1302-1311. doi: 10.2105/AJPH.2014.302525
 15. Chauhan P, Shaik R, Anusha D, Sotala M. (2019). A study to assess knowledge, attitude, and practices related to menstrual cycle and management of menstrual hygiene among school-going adolescent girls in a rural area of South India. *International Journal of Medical Science and Public Health*, **8**:114-9. doi: 10.5455/ijmsph.2019.1131809112018.
 16. GBD compare IHME Viz Hub. = 2019 [cited 2020]; Available from: <https://www.vizhub.healthdata.org/gbd-compare>.
 17. Anuradha, C. R., Komathi, J., & Subashree, A. (2020). A cross-sectional study on the knowledge, attitude, and practices of pharmacovigilance among health-care professionals at a tertiary care teaching hospital. *National Journal of Physiology, Pharmacy and Pharmacology*, **10**(08): 682-687. doi: 10.5455/njppp.2020.10.07174202012072020
 18. Parle J, Khatoon Z. (2019). Knowledge, attitude, practice and perception about menstruation and menstrual hygiene among adolescent school girls in rural areas of Raigad district. *International Journal of Community Medicine and Public Health*, **6**(6):2490-7. doi: <http://dx.doi.org/10.18203/2394-6040.ijcmph20192310>
 19. Hennegan, J., Sol, L. (2020). Confidence to manage menstruation at home and at school: findings from a cross-sectional survey of schoolgirls in rural Bangladesh. *Culture, Health and Sexuality*, **22**(2): 146-165. doi: 10.1080/13691058.2019.1580768.
 20. Acharya, M., Kathmandu, N., Acharya, P., Bohara, P. (2019). Public schools teenage girls in menstrual hygiene engagement sessions: sharing experiences with stakeholders. *The Online Journal of New Horizons in Education-October*, **9**(4):283-289.
 21. Haque, S. E., Rahman, M., Itsuko, K., Mutahara, M., Sakisaka, K. (2014). The effect of a school-based educational intervention on menstrual health: an intervention study among adolescent girls in Bangladesh. *BMJ Open*, **4**(7): 1-9. Doi: 10.1136/bmjopen-2013-004607.
 22. Mason, L., Nyothach, E., Alexander, K., Odhiambo, F. O., Eleveld, A., Vulule, J., et al. (2013). 'We keep it secret so no one should know'-A qualitative study to explore young schoolgirls attitudes and experiences with menstruation in rural Western Kenya. *PLoS One*, **8**(11): e79132. <https://doi.org/10.1371/journal.pone.0079132>

23. Shah, S. P., Nair, R., Shah, P. P., Modi, D. K., Desai, S. A., Desai, L. (2013). Improving quality of life with new menstrual hygiene practices among adolescent tribal girls in rural Gujarat, India. *Reproductive Health Matters*, **21**(41): 205-213. doi: 10.1016/S0968-8080(13)41691-9
24. Lawan, U. M., Yusuf, M. W., Musa, A. B. (2010). Menstruation and menstrual hygiene amongst adolescent school girls in Kano, Northwestern Nigeria. *African Journal of Reproductive Health*, **14**(3): 201-207.
25. Hakim, A., Shaheen, R., Tak, H. (2017). A cross sectional study on the knowledge, attitudes and practices towards menstrual cycle and its problems: A comparative study of government and non-government adolescent school girls. *International Journal of Community Medicine and Med. Public Health*, **4**: 973-981. doi: <http://dx.doi.org/10.18203/2394-6040.ijcmph20171309>
26. Yadav, R. N., Joshi, S., Poudel, R., Pandeya, P. (2017). Knowledge, attitude, and practice on menstrual hygiene management among school adolescents. *Journal of Nepal Health Research Council*, **15**(3): 212-216. doi: 10.3126/jnhrc.v15i3.18842
27. Dolan, C. S., Ryus, C. R., Dopson, S., Montgomery, P., Scott, I. (2014). A blind spot in girls' education: menarche and its webs of exclusion in Ghana. *Journal of International Development*, **26**(5): 643-657. <https://doi.org/10.1002/jid.2917>
28. Mmari, K., Gibbs, S., Moreau, C., Kabiru, C., Maina, B., Meyer, S. D., Zuo, X. (2016). "Yea, I've grown; I can't go out anymore": perceived risks for girls and boys entering adolescence. *Population Association of America*, Washington, DC 1(04).
29. Srinivasan, D., Agrawal, T., Attokaran, T., Fathima, F.N., Johnson, R. (2019). Awareness, perceptions and practices regarding menstruation and menstrual hygiene among students of a college in Bengaluru Urban district, South India: a cross sectional study. *International Journal of Community Medicine and Public Health*, **6**(3): 1126-1132. doi: <http://dx.doi.org/10.18203/2394-6040.ijcmph20190597>
30. Mudey, A. B., Kesharwani, N., Mudey, G. A., Goyal, R. C. (2010). A cross-sectional study on awareness regarding safe and hygienic practices amongst school going adolescent girls in rural area of Wardha District, India. *Global Journal of Health Science*, **2**(2): 225-231. doi:10.5539/gjhs.v2n2p225
31. Dhingra R, Kumar A. (2009). Knowledge and practices related to menstruation among tribal (Gujjar) adolescent girls. *Ethno-Med*, **3**(1): 43-48. <https://doi.org/10.1080/09735070.2009.11886336>
32. Sheikh, B. T., Rahim, S. T. (2006). Assessing knowledge, exploring needs: A reproductive health survey of adolescents and young adults in Pakistan. *The European Journal of Contraception and Reproductive Health Care*, **11**(2):132-137. doi:10.1080/13625180500389463.
33. Tasnim, S., Rahman, A., Ara, I. (2009). Talking about sexuality at secondary schools of pri-urban area of Dhaka city. *International Journal of Adolescent Medicine and Health*, **21**(4): 601-608. doi: 10.1515/ijamh.2009.21.4.601